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EXAMINER	
PICH, PONNOREAY	

ART UNIT	PAPER NUMBER
2135	

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/006,291	CHEN ET AL.	
	Examiner	Art Unit	
	Ponnoreay Pich	2135	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-17 and 32-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-17 and 32-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-10 and 18-30 were cancelled. Claims 31-36 were newly added. Claims 11-17 and 31-36 are pending.

The examiner assumes that the applicant agrees with any well-known prior art statements and/or rejections made by the examiner in the previous office action(s) that were not argued. Any objections or rejections not repeated below for record are withdrawn due to applicant's amendments and/or arguments.

Response to Arguments

The examiner has considered applicant's arguments which clarify what applicant's definition of a "path closure set" is. The objection of the specification to the definition of a path closure set is withdrawn in light of applicant's clarification. However, in light of this clarification, the previous office action's indication of allowable subject matter is withdrawn upon further consideration of the definition and the prior art. See below for new rejections. Any inconvenience is regretted.

Claim Objections

Claim 15 is objected to because of the following informalities: Claim 15 is missing a transition phrase after the preamble which makes the wording of the claim seems awkward. The examiner believes applicant meant to recite "wherein" before "determining" in line 1. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. As per claim 11, the first limitation as recited in lines 3-8 is indefinite. The claimed limitation recites locating a plurality of adjacent nodes in a sequence, the plurality of adjacent nodes being between a source node and a destination node in the network topology. From this, it appears that the source and destination node is not part of the sequence because the limitation defines the plurality of adjacent nodes in a sequence as being *between a source and destination node.* Then, the limitation goes on to recite that each located node in the sequence having at least two adjacent nodes, including a previous node in the sequence and a next node in the sequence. As the limitation previously defined a sequence as being nodes between a source and destination node, it is unclear how each node in the sequence can have at least two adjacent nodes, including a previous node in the sequence and a next node in the sequence. Consider a network with nodes A, B, C, and D all in a straight line in the order given. A is the source and D is the destination. Clearly B and C are in a sequence, but B is adjacent to A and C and C is adjacent to B and D. Since A and D aren't considered part of the sequence, B and C cannot have at least two adjacent nodes, including a previous node in the sequence and a next node in the sequence. Claim 1 goes on to recite "for each located node in the sequence: determining if the located node is the destination node." At this point, the claim is

implying that the located node in the sequence can be the destination node. This clearly is a contradiction to the earlier statement of a plurality of nodes in a sequence being between a source node and a destination node. A destination node if it was part of a sequence cannot be between itself. Also if one were to consider the destination as part of the sequence, then from the earlier example above, we can see that D cannot have at least two adjacent nodes including a previous and next node in the sequence as the destination is the final node and the next node is recited as being different than the previous node. The examiner will make art rejections using art that is closest to the limitations recited in claim 1 as possible, though the limitations as recited appear to contradict each other.

2. Any claims not specifically addressed are rejected by virtue of dependency.
3. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11-17 and 31-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Callon (US 6,256,295) in view of Zaumen et al (US 5,881,243).

Claim 11:

Callon discloses the limitation of locating a plurality of adjacent nodes in a sequence, the plurality of adjacent nodes being between a source node and a destination node in the network topology, each located node in the sequence having at least two adjacent nodes, including a previous node in the sequence and a next node in the sequence, wherein for each located node in the plurality of adjacent nodes, the next node is different than the previous node (col 2, lines 46-52 and col 3, lines 45-57).

Callon discloses for each located node in the sequence: determining if the located node is the destination node, and if the located node is the destination node, then identifying each node in the sequence as being part of a path closure set between the source node and the destination node (Fig 6).

Callon does not explicitly disclose for each located node in the sequence: determining if the located node is a loop closure node, and if the located node is a loop closure node, then determining if one or more nodes in the sequence that are part of a loop path defined by the loop closure node are already designated as being part of the path closure set, and if one or more nodes in the sequence that are part of a loop path defined by the loop closure node are already designated as being part of the path closure set, then designating each node in the loop path as part of the path closure set, else designating each node in the path as part of the path closure set if at least a designated node in the loop path is subsequently determined to be part of the path closure set.

However, note applicant's definition of a "path closure set" is "a select set of nodes between a source node and a destination node" (p7, paragraph 34). Further,

Zaumen discloses that at the time applicant's invention was made, there existed known methods in the art for finding the shortest distance path from a source node to destination node which includes nodes in a loop within the set of nodes between a source node and a destination node, i.e. a path closure set (col 1, lines 40-63). This reads on the above limitation not met by Callon because if the nodes in a loop contain at least one node which was previously or is later identified as part of a path closure set and that node is not a loop closure node, then one can traverse the nodes in that loop to get to the destination from the source node as long as one exit the loop at some point, i.e. via the identified or later identified node which is part of a path closure set. By definition, the nodes in the loop, which also meet the above-recited limitation not disclosed by Callon, are nodes in a path closure set as they are a select set of nodes between a source node and a destination node.

In light of this, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Callon's invention, using the teachings of the prior art as disclosed by Zaumen, according to the limitations recited in claim 11. One of ordinary skill would have been motivated to do so as it would allow Callon's invention to find the shortest path between a source and destination node among the group of non-overlapping paths found by his teachings alone.

Claim 12:

Callon and Zaumen do not explicitly disclose wherein locating a plurality of adjacent nodes in a sequence includes locating each node in the network topology using the sequence. However, this limitation is obvious to Callon and Zaumen's

combination invention. As mentioned, one of ordinary skill would have been motivated to incorporate Zaumen's teachings of the prior art with Callon because it would allow Callon to find the shortest path from a source to destination node. The only way that one can know for sure if a path found is the shortest path or not is by locating every path from source to destination node by locating each node in the network topology using the sequence.

Claim 13:

Callon and Zaumen do not explicitly disclose identifying one or more enforcement security devices from nodes in the path closure set. However, as mentioned in the previous office action, enforcement security devices in a network, i.e. firewalls, as well as having to identify them were well known at the time applicant's invention was made. Note that Callon and Zaumen's combination invention would be used to identify the shortest path between a source and destination node. In networking terms, shortest path often means, path with the shortest total transmission time from source to destination. When calculating the cost of a transmission path which involves an enforcement security device, one must take into consideration any time necessary to negotiate security protocols to forward a message through the security device to the next node. One cannot do so without identifying which nodes in the path closure set are enforcement security devices and what types they are. At the time applicant's invention was made, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Callon and Zaumen's combination invention according to the limitations recited in claim 13. One of ordinary skill would have been

motivated to do so as it would allow Callon and Zaumen's combination invention to determine the time cost associated with a transmission link having an enforcement security device, which is needed to determine the shortest distance path.

Claim 14:

Callon and Zaumen do not explicitly disclose identifying one or more enforcement security devices from nodes in the path closure set. However, this limitation is the same as what is recited in claim 13 and is rejected for the same reasons. Callon and Zaumen do not explicitly disclose implementing a security policy on the identified one or more enforcement security devices. However, by definition, enforcement security devices have security policies implemented on them or they would not be enforcement security devices.

Claim 15:

Callon and Zaumen do not explicitly disclose determining that the located node is a loop closure node includes determining that the located node was located as a next node for at least two other nodes in the sequence. However, the limitation as recited is the only way to determine if a node is a loop closure node or not outside of manual inspection by a person. Determining if a loop exists and if a node is a loop closure node was well known in the art at the time applicant's invention was made. It would have been obvious to one of ordinary skill in the art to modify Callon and Zaumen's combination invention according to the limitation recited in claim 15 because it would allow for computerized determination of a network topology without human intervention.

Claim 16:

Callon and Zaumen do not disclose wherein designating each node in the loop path as part of the path closure set if a designated node in the loop path is subsequently determined to be part of the path closures set includes designating each node in the loop path as part of the path closure set if one of the at least two nodes in the sequence that are adjacent to the loop node is subsequently determined to be part of the path closure set.

However, this limitation is obvious to Callon and Zaumen's combination invention. As mentioned, in the teachings of the prior art disclosed by Zaumen, when finding the shortest path from a source node to a destination node, sometimes loops can be present in the path found. The only way for a loop to have been included in the shortest path found from source to destination node was if there was a way to exit the loop via a node that was a part of the loop and was part of a non-looping path from the source to destination node which was not the node which started the loop in the first place, i.e. the loop closure node. This "exit node" can be one of the two nodes that are adjacent to the loop closure node or a different node in the set of nodes which form the loop excluding the loop closure node itself. Without such a node, an infinite loop would occur and there would be no shortest path which includes loops.

Claim 17:

Callon and Zaumen do not explicitly wherein locating a plurality of adjacent nodes in a sequence includes locating the plurality of nodes using a depth-first methodology. However, as mentioned in the previous office action, using a depth-first search to locate a plurality of adjacent nodes in a sequence was well known in the art.

It would have been obvious to one of ordinary skill in the art to do use a depth-first search in Callon and Zaumen's combination invention to locate a plurality of adjacent nodes in a sequence because depth-first searches are memory efficient.

Claims 31, 33, and 35:

Callon discloses the limitation of identifying a source node and destination node for traffic that is to be sent through the network topology (col 3, lines 33-44 and Fig 2).

Callon does not disclose for each particular node in the network topology, adding the particular node to a path closure set for the source node and the destination node if the particular node is part of a looping sequence of nodes in which (a) at least one node in the looping sequence is already designated as being part of the path closure set and (b) the at least one node designated as being part of the path closure set is not also a loop closure node for that looping sequence.

However, as mentioned in claim 11, Zaumen discloses that it was well known in the art, methods for finding the shortest path from a source node to destination node which includes nodes in a loop within the set of nodes between a source node and a destination node, i.e. a path closure set (col 1, lines 40-63). As discussed in claim 11, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Callon's invention using the prior art teachings disclosed by Zaumen. One of ordinary skill would have been motivated to do so for the reasons given in claim 11.

The limitation recited above which is not met by Callon set forth the conditions which if true would allow the set of nodes forming the shortest path to include the nodes

which forms a loop. If this condition did not exist, then there would be no shortest distance path with a loop because an infinite loop would occur. As Zaumen discloses that including nodes which form a loop in the set of nodes which form a shortest path is possible, this reads on the above limitation not met by Callon.

Callon and Zaumen do not disclose storing a list of one or more security devices that occur in the path closure set. However, security devices being a part of a network topology was well known in the art at the time applicant's invention was made. One of ordinary skill would have been motivated to have security devices in a network, as it would provide security to the network. That said, it is then obvious that if there were security devices in the network that Callon's modified invention would store a list of one or more security devices in the path closure set. Note in the flow chart of Figure 6 that as Callon's invention traverses the network to determine paths from the source to destination node, nodes which form such paths are added to a PATHS database. If one of the nodes which form such a path happens to also be a security device, then that node would be added to the PATHS database without consideration for what type of node it was. The PATHS database reads on a list of one or more security devices in the path closure set because it contains a listing of all nodes in the path closure set, including any which also happens to be security devices.

Claims 32, 34, and 36:

Callon discloses the limitation of identifying a source node and destination node for traffic that is to be sent through the network topology (col 3, lines 33-44 and Fig 2).

Callon does not explicitly disclose for each particular node in the network topology, adding the particular node to a path closure set for the source node and the destination node if the particular node is part of a looping sequence of nodes in which at least one node adjacent to a loop closure node for that looping sequence of nodes is subsequently identified as being part of the path closure set.

However, as mentioned in claim 11, Zaumen discloses that it was well known in the art, methods for finding the shortest path from a source node to destination node which includes nodes in a loop within the set of nodes between a source node and a destination node, i.e. a path closure set (col 1, lines 40-63). As discussed in claim 11, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Callon's invention using the prior art teachings disclosed by Zaumen. One of ordinary skill would have been motivated to do so for the reasons given in claim 11.

Because it is possible for a shortest path to include the set of nodes which forms a loop, then it is obvious that at least one of the nodes in the set of nodes which forms a loop can be used to exit the loop and continue onto the destination node. Whether that node is adjacent to the loop closure node or not is arbitrary. Zaumen's disclosure of temporary loops in the shortest path set of nodes reads on the above limitation not met by Callon.

Callon and Zaumen do not disclose storing a list of one or more security devices that occur in the path closure set. However, security devices being a part of a network topology was well known in the art at the time applicant's invention was made. One of

ordinary skill would have been motivated to have security devices in a network as it would provide security to the network. That said, it is then obvious that if there were security devices in the network that Callon's modified invention would store a list of one or more security devices in the path closure set. Note in the flow chart of Figure 6 that as Callon's invention traverses the network to determine paths from the source to destination node, nodes which form such paths are added to a PATHS database. If one of the nodes which form such a path happens to also be a security device, then that node would be added to the PATHS database without consideration for what type of node it was. The PATHS database reads on a list of one or more security devices in the path closure set because it contains a listing of all nodes in the path closure set, including any which also happens to be security devices.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponnoreay Pich whose telephone number is 571-272-7962. The examiner can normally be reached on 9:00am-4:30pm Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on 571-272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ponnoreay Pich
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